HAO Colloquium Series

(Refreshments served)

Speaker: **Youhei Masada, Kobe University**

Time: **1:30–2:30 pm**

Date: **Wednesday, September 7, 2011**

Location: **CG1-South Auditorium**

Title: **A Possible Role of MRI-driven MHD Turbulence in the Solar Interior**

Abstract:

The most promising candidate for angular momentum transport in the astrophysical accretion disk is MHD turbulence driven and sustained by magnetorotational instability (MRI). In my talk, I will present at first the basic properties of the MRI in the solar and stellar interiors. Then I will discuss a possible role of MRI-driven turbulence in the solar interior on the basis of linear and nonlinear theories coupling with physical parameters, providing solar rotation profile inverted from the helioseismic observation and a standard solar model. According to the solar rotation profile drawn by the helioseismology, the MRI venue is confined to the higher-latitude tachocline and lower-latitude near surface shear layer of the Sun. It is especially interesting that the MRI active region around the tachocline closely overlaps with the area indicating a steep entropy rise which is required from the thermal wind balance (TWB) in the sun. This implies that the MRI-driven turbulence plays a crucial role in maintaining the TWB in the sun via the exceptional turbulent heating and equatorward angular momentum transports. Additionally, the preliminary results of our numerical study of the MRI in the stellar interior will be also presented. With COS we have now measured far-UV continuum emission formed in the chromospheres of solar-mass stars with ages between 100 Myr and 5 Gyr. Comparison with semi-empirical solar models of Fontenla (2011) suggests that the chromospheric structures of the youngest solar mass stars are similar to bright solar plages.